REMARKS

Claims 38-62 are pending in this application. Claims 38-48, 61 and 62 are withdrawn from consideration as directed to a non-elected invention. Claims 38-55 and 59-62 are canceled herein without prejudice. Claims 56-58 are amended herein for clarity to more particularly define the invention. New claims 63-113 are added herein. Support for these amendments and new claims is found in the language of the original claims and throughout the specification, as set forth below. No new matter is added by these amendments and new claims and their entry and consideration are respectfully requested. In light of these amendments and new claims and the following remarks, applicants respectfully request reconsideration of this application and allowance of the pending claims to issue.

I. Recordation of Interview Summary in accordance with M.P.E.P. § 713.04

Applicants wish to make of record the Interview Summary prepared and submitted to applicants by Examiner Sitton on August 24, 2006. Applicants concur that this Interview Summary accurately reflects the substance of the telephone interview on August 15, 2006, in which Examiner Sitton and applicants' representative, Dr. Mary Miller, participated. Applicants appreciate the opportunity to discuss this application and pending claims with the Examiners

II. Priority

The Office Action states that the pending claims are not awarded the benefit of provisional application 60/159,137 because SEQ ID NO:65 was not disclosed in this provisional application.

Applicants respectfully submit that the subject matter of claims 56-58 and new claims 63-113 is clearly supported in U.S. Provisional Application No. 60/159,137, as well as in the pending utility application, as set forth below, and applicants are thus entitled to the priority date of October 12, 1999 for these claims.

In particular, claim 56 recites a method of identifying a Caucasian human subject as having an increased risk of accelerated HIV-1 disease progression, comprising identifying the presence of a CCR5 haplotype pair HHE/HHE in the subject. Support for this claim is found in U.S. Provisional Application No. 60/159,137, at least on page 5, lines 2-4; page 5, line 31 through page 6, line 5; page 16, line 23 through page 18, line 13; page 158, lines 15-27; page 169, line 14 through page 170, line 6; Example 7; and page 224, lines 8-10 (claim 2). Support for claim 56 is found in U.S. Application No. 10/089,595 at least on page 3, lines 1-14, on page 160, lines 25-29, Figure 2 and original claims 20, 28 and 35.

Claim 57 and dependent claims 63-66 recite a method of identifying an African-American human subject as having an increased risk of accelerated HIV-1 disease progression, comprising identifying the presence of a CCR5 haplotype pair in the subject, wherein the haplotype pair is selected from the group consisting of: a) HHC and HHF*1; b) HHC and HHE; c) HHC and HHC; and d) HHC and HHD. Support for these claims is found in U.S. Provisional Application No. 60/159,137, at least on page 5, lines 5-8; page 5, line 31 through page 6, line 8; page 16, line 23 through page 18, line 13; page 158, lines 15-27; page 169, line 14 through page 170, line 6; Example 7; and page 224, lines 13-16 (claim 3). Support for claim 56 is found in U.S. Application No. 10/089,595 at least on page 3, lines 1-14, on page 161, 1-12, Figure 3 and original claims 21, 29 and 36

Claim 58 and dependent claims 67-69 recite a method of identifying a human child as having an increased risk of accelerated HIV-1 disease progression, comprising identifying the presence of a CCR5 haplotype pair in the child, wherein the haplotype pair is selected from the group consisting of: a) HHC and HHE; b) HHE and HHE; and c) HHE and HHG*2. Support for these claims is found in U.S. Provisional Application No. 60/159,137, at least on page 5, lines 8-13; page 5, line 31 through page 6, line 12; page 16, line 23 through page 18, line 13; page 158, lines 15-27; page 169, line 14 through page 170, linc 6; Example 6; and page 224, lines 19-22 (claim 4). Support for claim 56 is found in U.S. Application No. 10/089,595 at least on page 3, lines 1-14, on page 142, lines 20-22, Figure 4A and original claims 22, 30, 32 and 37.

Claim 70 recites a method of identifying a Caucasian human subject as having an increased risk of becoming infected with an HIV-1 virus, comprising detecting the presence of a CCR5 haplotype pair HHE/HHE in the subject. Support for this claim is found in U.S. Provisional Application No. 60/159,137, at least on page 5, lines 2-4; page 5, line 31 through page 6, line 5; page 16, line 23 through page 18, line 13; page 158, lines 15-27; page 169, line 14 through page 170, line 6; Example 7; and page 224, lines 8-10 (claim 2). Support for claim 56 is found in U.S. Application No. 10/089,595 at least on page 3, lines 1-14, page 5, lines 23-33, in Example 7 and in original claims 20, 28 and 35.

Claim 71 and dependent claims 73-76 recite a method of identifying an African-American human subject as having an increased risk of becoming infected with an HIV-1 virus, comprising detecting the presence of a CCR5 haplotype pair in the subject, wherein the haplotype pair is selected from the group consisting of: a) HHC/HHF*1; b) HHC/HHE; c) HHC/HHC; and d) HHC/HHD. Support for these claims is found in U.S. Provisional Application No. 60/159,137, at least on page 5, lines 5-8; page 5, line 31 through page 6, line 8; page 16, line 23 through page 18, line 13; page 158, lines 15-27; page 169, line 14 through page 170, line 6; Example 7; and page 224, lines 13-16 (claim 3). Support for claim 56 is found in U.S. Application No. 10/089,595 at least on page 3, lines 1-14, page 5, lines 23-30, page 6, lines 1-4, in Example 7 and in original claims 21, 29 and 36.

Claim 72 and dependent claims 77-79 recite a method of identifying a human child as having an increased risk of becoming infected with an HIV-1 virus, comprising detecting the presence of a CCR5 haplotype pair in the child, wherein the haplotype pair is selected from the group consisting of: a) HHC/HHE; b) HHE/HHE; and c) HHE/HHG*2. Support for these claims is found in U.S. Provisional Application No. 60/159,137, at least on page 5, lines 8-13; page 5, line 31 through page 6, line 12; page 16, line 23 through page 18, line 13; page 158, lines 15-27; page 169, line 14 through page 170, line 6; Example 6; and page 224, lines 19-22 (claim 4). Support for claim 56 is found in U.S. Application No. 10/089,595 at least on page 3, lines 1-14, page 6, lines 10-15, in Table 6 on page 140, page 141, line 23 through page 142, line 3, Table 7 on page 141 and original claims 30, 32 and 37.

Claims 80-86, 94, 96-100 and 106-109 recite methods of identifying subjects as having an increased risk of accelerated HIV-1 disease progression, comprising detecting the presence or absence of the claimed CCR5 haplotypes of this invention. Support for these claims is found in U.S. Provisional Application No. 60/159,137 at the locations cited above for claims 56-58 and 63-69, and at least in particular in Examples 6 and 7. Support for claim 56 is found in U.S. Application No. 10/089,595 at least on page 3, lines 1-14, page 5, lines 18-30, Figure 4B, Examples 6 and 7 and original claims 16, 18, 19, 26, 27, 33 and 34.

Claims 87-93, 95, 101-105 and 110-113 recite methods of identifying subjects as having an increased risk of becoming infected with an HIV-1 virus, comprising detecting the presence or absence of the claimed CCR5 haplotypes of this invention. Support for these claims is found in U.S. Provisional Application No. 60/159, 137 at the locations cited above for claims 70-79 and at least in particular in Examples 6 and 7. Support for claim 56 is found in U.S. Application No. 10/089,595 at least on page 3, lines 1-14, page 5, lines 18-30, Figure 4B, Examples 6 and 7 and original claims 16, 17, 19, 26, 27, 33 and 34.

Thus, the rejections of the present Office Action will be addressed on the basis of applicants' understanding that October 12, 1999 is the priority date for this application and for the claims as presented herein.

Applicants also point out, pursuant to the Examiner's comments in the August 15, 2006 telephone interview, that the haplotypes that make up the haplotype pairs as claimed in the present invention are defined in several places throughout both the provisional application and present application. In particular, applicants point out the description on page 4, lines 8-16 of the utility application and on page 17, lines 24-30 of the provisional application (describing Figure 15D), wherein the haplotypes are defined as being identified by a "signature motif," which describes the 7-letter SNP signature that defines the nucleotides at CCR5 positions 29, 208, 303, 627, 630, 676 and 927. The inclusion of the CCR5-Δ32 or CCR2 64I polymorphisms in haplotypes HHG*2 and HHF*2, respectively, is described on page 5, lines 7-12 (describing

Figure 1D) of the utility application and on page 17, line 30 through page 18, line 2 of the provisional application. These haplotypes are further described on page 169, line 13 through page 170, line 6, on page 185, lines 6-22, and on page 186, lines 9-11 of the provisional application, as well as on page 9, lines 18-28, on page 136, lines 6-29 and on page 149, lines 16-21 of the utility application.

III. Objection to specification

The Office Action states that the specification is objected to because it contains an embedded hyperlink.

The specification is amended herein on pages 70-71, 99 and 152 to delete any embedded hyperlink, as requested by the Examiner. Thus, this objection has been rendered moot and applicants respectfully request its withdrawal.

IV. Objection to claims

The Office Action states that claims 49-60 are objected to for being dependent on withdrawn claims.

Claims 49-60 are either canceled herein without prejudice or amended herein to no longer depend from withdrawn claims, thereby rendering this objection moot and applicants respectfully request its withdrawal.

V. Rejection under 35 U.S.C. § 112, second paragraph

A. The Office Action states that claims 49-60 are rejected under 35 U.S.C. § 112, second paragraph, as allegedly indefinite in their dependency to claim 38.

Claims 49-60 are either canceled herein or amended herein to no longer depend from claim 38, thereby rendering this rejection moot and applicants respectfully request its withdrawal.

B. The Office Action states that the claims are not clear in the recitation of the terms "haplotype group" and "haplogroup."

Claims 56-76 as presented herein do not recite the terms "haplotype group" or "haplogroup," but instead recite haplotype pair, as described on page 5, line 31 to describe the allelic combinations set forth in these claims. Thus, this objection has been rendered moot and applicants respectfully request its withdrawal.

C. The Office Action states that the phrase "the human CCR2 polymorphisms" lacks proper antecedent basis.

Claim 53 is canceled herein and this phrase does not appear in any of the pending or new claims. Thus, this objection has been rendered moot and applicants respectfully request its withdrawal.

VI. Rejection under 35 U.S.C. § 102(b)

The Office Action states that claims 49-51 and 53-57 are rejected under 35 U.S.C. § 102(b) as allegedly anticipated by Mummidi et al. Specifically, the Office Action states that Mummidi et al. teaches detecting the CCR5 haplotype of individuals on both CCR5 alleles and correlating haplotypes with HIV progression in different racial populations. The Office Action further states that, with regard to claim 56, Mummidi et al. teaches correlating the disease retarding effect of the CCR5 32 base pair deletion mutation in Caucasians and African Americans and teaches of a weak effect of the deletion and CCR5 29G and that accordingly, as all haplotypes other than HHF*1 appear to lack the 32 base pair deletion in CCR5 as listed in claim 38, Mummidi et al. inherently correlates an increased risk of disease progression with regard to the haplotypes listed in claim 56 and Caucasians. The Office Action goes on to state that with regard to claim 57, Mummidi et al. teaches of the disease retarding effect in African Americans of the 64I allele in CCR2 and that accordingly, as all haplotypes except for HHG*2 appear to lack the 64I allele as listed in claim 38, Mummidi et al. inherently correlates an

increased risk of disease progression with regard to the haplotypes listed in claim 57 in African Americans.

Claims 49-51 and 53-55 are canceled herein without prejudice, thereby mooting this rejection as it pertains to these claims.

Claim 56 as presented herein recites a method of identifying a Caucasian human subject as having an increased risk of accelerated HIV-1 disease progression, comprising detecting the presence of the haplotype pair HHE/HHE in the CCR5 gene of the subject.

Claim 57 as presented herein recites a method of identifying an African-American human subject as having an increased risk of accelerated HIV-1 disease progression, comprising detecting the presence of a haplotype pair in the CCR5 gene of the subject, wherein the haplotype pair is selected from the group consisting of: a) HHC/HHF*1; b) HHC/HHE; c) HHC/HHC; and d) HHC/HHD.

These claims are not anticipated by the Mummidi et al. reference. Specifically, according to the Examiner, the Mummidi et al. reference is alleged to inherently teach that the presence of the haplotype pair HHE/HHE in the CCR5 gene of a Caucasian human subject identifies that subject as having an increased risk of HIV-1 disease progression and that the presence of any of the haplotype pairs HHC/HHE, HHC/ HHF*1, HHC/HHC or HHC/HHD in the CCR5 gene of an African American human subject identifies that subject as having an increased risk of HIV-1 disease progression, respectively. These allegations are made by the Examiner on the basis that the Mummidi et al. reference teaches nothing more than a disease retarding effect of the 32 base pair deletion mutation in CCR5 in Caucasians and African Americans and a weak effect of the deletion and CCR5 29G and a disease retarding effect in African Americans of the 64I allele in CCR2. The Mummidi et al. reference provides no teaching or suggestion of the haplotype pairs of the claimed invention or the correlation of these specific haplotype pairs with an increased risk of HIV-1 disease progression in either Caucasians or African Americans. In essence, the Examiner appears to be saying that any and all haplotypes that lack the 32 base pair deletion in

CCR5 or the 64I allele in CCR2 are correlated with increased risk of HIV-1 disease progression, although the Examiner has provided no evidence in support of this interpretation or that Mummidi et al. inherently teaches the claimed methods of the present invention.

In particular, applicants wish to point out the legal standard for inherency, as set forth in section 2112 in the MPEP, wherein In re Robertson is cited as stating that "[t]o establish inherency, the extrinsic evidence must make clear that the missing descriptive matter is necessarily present in the thing described in the reference, and that it would be so recognized by persons of ordinary skill. Inherency, however, may not be established by probabilities or possibilities. The mere fact that a certain thing may result from a given set of circumstances is not sufficient." (169 F.3d 743, 745, 49 USPQ2d 1949, 1950-51 (Fed. Cir. 1999). (Emphasis added.) The MPEP also cites Ex parte Levy as stating that "[i]n relying upon the theory of inherency, the examiner must provide a basis in fact and/or technical reasoning to reasonably support the determination that the allegedly inherent characteristic necessarily flows from the teachings of the applied prior art." (17 USPQ2d 1461, 1464 (Bd. Pat. App. & Inter. 1990)). (Emphasis in original.) It is clear from these cases that in order for the standard for inherency to be properly cited in an anticipation rejection, 1) the allegedly inherent characteristic must necessarily flow from the teachings of the cited art; 2) such an inherent disclosure must be recognized as such by a person of ordinary skill in the art; and 3) such a determination must be supported by fact or technical reasoning.

In the present case, there is no teaching or suggestion in the Mummidi et al. reference that any haplotype pairs that lack the 32 base pair deletion in CCR5 or the 64I allele in CCR2 are correlated with an increased risk of HIV-1 disease progression or that the haplotype pairs HHE/HHE, HHC/HHF*1, HHC/HHE, HHC/HHC or HHC/HHD are correlated with an increased risk of HIV-1 disease progression in any human subject. There is no fact or technical reasoning provided in support of the Examiner's allegation that Mummidi et al. inherently teaches these correlations, as required to demonstrate that the methods of the claimed invention are inherently disclosed in the Mummidi et al. reference. Furthermore, there is no indication that such an inherent disclosure would be recognized by one of ordinary skill in the art, nor is there

any evidence that the claimed methods necessarily flow from the teachings of the Mummidi et al. Therefore the claimed methods of this invention cannot be anticipated as inherent in the teachings of Mummidi et al. For at least these reasons, applicants believe this rejection has been overcome and respectfully request its withdrawal.

VII. Rejection under 35 U.S.C. § 102(e)

The Office Action states that claims 49-51 and 53-57 are rejected under 35 U.S.C. § 102(e) as allegedly anticipated by Kaslow et al. Specifically, the Office Action states that Kaslow et al. teaches detecting the CCR5 haplotype of individuals on both CCR5 alleles, including detecting the CCR2 V/I mutation and the 32 base pair deletion in CCR5 and correlating haplotypes with HIV-1 progression in different racial populations. The Office Action further states that, with regard to claim 56, Kaslow et al. specifically teaches that 2 HHE copies increased risk of disease progression in Caucasians, citing column 37 of the Kaslow et al. patent.

Claims 49-51 and 53-55 are canceled herein without prejudice, thereby mooting this rejection as it pertains to these claims.

Applicants note, as explained above, that the priority date for the presently claimed invention is October 12, 1999. Applicants also note that the Kaslow et al. patent issued from U.S. Application No. 09/638,509 ('509 application), which was filed on August 11, 2000. The '509 application claims the benefit of U.S. Provisional Application No. 60/148,530 ('530 application), filed on August 12, 1999. Applicants have reviewed the '530 provisional application and note that there is no mention of any of the haplotype pairs of the presently claimed invention or of a correlation of the claimed haplotypes with increased HIV-1 disease progression. Thus, it appears that the subject matter of Kaslow et al. upon which the Examiner relies in making this rejection first appears in the '509 application and therefore, this subject matter has a priority date of August 11, 2000. As the presently claimed invention has a priority date that is earlier than August 11, 2000, the Kaslow et al. patent is not prior art under 35 U.S.C. § 102(e) against the presently claimed invention. Thus, this rejection has been rendered moot and applicants respectfully request its withdrawal.

VIII. Rejection under 35 U.S.C. § 102(a)

The Office Action states that claims 49-51 and 53-57 are rejected under 35 U.S.C. § 102(a) as allegedly anticipated by Gonzalez et al.

Applicants respectfully point out that the Gonzalez et al. publication is dated October 12, 1999 and the priority date of the presently claimed invention is October 12, 1999. Thus, the Gonzalez et al. publication is not prior art under 35 U.S.C. § 102(a) against the claims of the present invention. Thus, this rejection has been rendered moot and applicants respectfully request its withdrawal.

IX. Rejection under 35 U.S.C. § 103

A. The Office Action states that claims 49-50 and 52-55 are rejected under 35 U.S.C. § 103 as allegedly obvious over Buseyne et al. in view of Mummidi et al.

Claims 49-50 and 52-55 are canceled herein without prejudice, thereby rendering this rejection moot and applicants respectfully request its withdrawal.

B. The Office Action states that claims 59-60 are rejected under 35 U.S.C. § 103 as allegedly obvious over Mummidi et al, Kaslow et al., Choi et al. or Gonzalez et al. in view of Hogg et al.

Claims 59-60 are canceled herein without prejudice, thereby rendering this rejection moot and applicants respectfully request its withdrawal.

X. New claims 63-113

New claims 63-113 presented herein recite embodiments previously presented in claims 56, 57 and 58 and support for these new claims can be found in U.S. Provisional Application No. 60/159,137 and in U.S. application no. 10/089,595, as set forth above. For the reasons provided herein to distinguish claims 56, 57 and 58 from the cited art, these new claims 63-113 are also

distinguished from the cited art and are thus believed to be in condition for allowance, which action is respectfully requested.

Having addressed all of the issues raised by the Examiner in the pending Office Action, applicants believe the claims as presented herein are in condition for allowance, which action is respectfully requested. The Examiner is encouraged and invited to contact the undersigned directly, if such contact will expedite the prosecution of the pending claims to issue.

The Commissioner is authorized to charge Deposit Account No. 50-0220 in the amount of $120.00 fee for a one month extension of time, as well as additional claim fees. The Commissioner is hereby authorized to charge any deficiency or credit any overpayment to Deposit Account No. 50-0220.

Respectfully submitted,

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CERTIFICATION OF FACSIMILE TRANSMISSION UNDER 37 CFR § 1.8

I hereby certify that this correspondence is being facsimile transmitted to the Patent and Trademark Office via the central facsimile number 571-273-8300 on September 1, 2006 and is addressed to Mail Stop Amendment, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Tracy Wallace